7.05 Depreciation Methods

Depreciation is a systematic and rational method of allocating the cost of an asset to the periods benefited.

Matching Concept

Straight-Line Method (S/L)

- Used when assets give equal benefits to the company throughout their useful lives (eg, a building).
- Depreciation expense is the same amount each year.
- Depreciation rate = 1/useful life (1/5 years = 20%)
- Considers depreciation a function of time instead of a function of usage.

$$\frac{\text{Cost} - \text{Salvage Value}}{\text{Useful Life}} = \text{Depreciation Expense}$$

- To record depreciation:

Depreciation Expense (I/S)	X	
Accumulated Depreciation		X

Contra-asset account (reduces asset)

Accelerated Methods

Accelerated methods are used when an asset gives greater benefits in earlier years than in later years (eg, office equipment).

Sum of the Years Digits (SYD)

SYD is an accelerated depreciation method that is considered less aggressive than the double-declining balance method.

- Numerator = The number of years left in the asset's useful life.
- Denominator = The sum of the years in the asset's useful life. The formula is **N(N+1)/2.**

$$(\text{Cost} - \text{Salvage Value}) \times \left(\frac{\text{\# of years left in asset's life}}{\text{Sum of years in asset's life}}\right) = \text{Depreciation Expense}$$

Assuming a 3-year asset, in year 1 the numerator would be 3, then 2, then 1. The denominator would be 3+2+1, or 3(3+1)/2 = 6. In year 1, depreciation will be the basis multiplied by 3/6. For year 2, multiply the basis by 2/6. For year 3, multiply by 1/6.

Straight-Line	**SYD**	**Y1**	**Y2**	**Y3**
1/3 = Rate	3	3/6	2/6	1/6
	2			
	1			
	= **6**			

$$\frac{3\,(3+1)}{2}$$

Double-Declining Balance (DDB)

- DDB is depreciation rate that is twice the straight-line rate is applied against the book value of the asset. For example, 1/5 = 20% (S/L rate) × 2 = 40% (DDB rate)
- Salvage value is ignored.
- Depreciation expense should not be reduced below the salvage value. In the final year either:
  - Calculate depreciation expense in the last year as the amount to reduce the carrying value to the salvage value.
  - Switch from DDB to either SYD or S/L toward the end of the asset's useful life, depreciating the asset to its salvage value.
- Balance declines; DDB rate stays the same.

Depreciation Expense Yr 1

$$\text{Cost} \times \left(\frac{1}{\text{\# of Years}}\right) \times 2$$

Depreciation Expense Yr 2

(Cost – Depreciation Expense Yr 1) × DDB%

Units of Production (UOP) – Activity Method

(Variable Charge approach or Physical usage depreciation)

- Assumes depreciation is a function of use (machine hours) or productivity (finished widgets) instead of the passage of time.

$$(\text{Cost} - \text{SV}) \times \frac{\text{hours this year}}{\text{Total estimated hours}} = \text{Depreciation expense}$$

Benefits of Accelerated Methods

- Better **matching** since asset is more productive in earlier years.
- Minimize loss due to **obsolescence.** Since the asset was depreciated more quickly, the carrying value is lower; therefore, the loss is smaller.

- **Helps to even out expenses**. Since repairs and maintenance in the earlier years is lower, if we take more depreciation earlier on, the total expenses would be more constant over time.